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January 22, 2007

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Art Unit 2872

Attn: Mail Stop Appeal Brief - Patents

Re: U.S. Utility Patent Application
Application No. 10/607,193; Filed: June 27, 2003
For: **Relay Lens Used in an Illumination System of a Lithography System**
Inventors: Ryzhikov *et al.*
Our Ref: 1857.0910001

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Fee Transmittal;
2. Credit Card Payment Form (PTO-2038) in the amount of \$500.00 to cover:
\$500 fee under 37 C.F.R. §41.20(b)(2);
3. Brief on Appeal Under 37 C.F.R. §41.37; and
4. Return postcard.

It is respectfully requested that the attached postcard be stamped with the date of filing of these documents, and that it be returned to our courier.

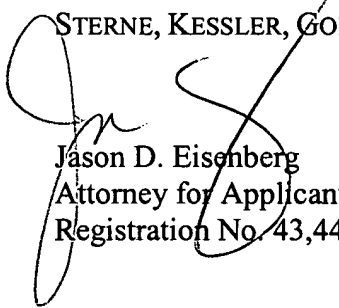
In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

Commissioner for Patents
January 22, 2007
Page 2

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

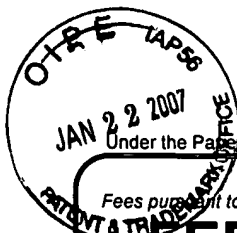
Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.



Jason D. Eisenberg
Attorney for Applicants
Registration No. 43,447

JDE/la
Enclosure(s)



Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500

Complete if Known

Application Number	10/607,193
Filing Date	June 27, 2003
First Named Inventor	Lev Ryzhikov
Examiner Name	Joshua L. Pritchett
Art Unit	2872
Attorney Docket No.	1857.0910001

METHOD OF PAYMENT (check all that apply)☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 19-0036 Deposit Account Name: Sterne, Kessler, Goldstein & Fox P.L.L.C.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	
- 20 or HP =	x	=		Fee (\$)	Fee Paid (\$)

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
- 3 or HP =	x	=	

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Fee under 37 C.F.R. §41.20(b)(2)

500

SUBMITTED BY

Signature	Registration No. (Attorney/Agent)	Telephone
Name (Print/Type)	43,447	(202) 371-2600
Jason D. Eisenberg	Date	1/22/07

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Ryzhikov et al.

Appl. No.: 10/607,193

Filed: June 27, 2003

Confirmation No.: 5795

Art Unit: 2872

Examiner: Joshua L. Pritchett

Atty. Docket: 1857.0910001

For: **Relay Lens Used in an
Illumination System of a
Lithography System**

Brief on Appeal Under 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

A Notice of Appeal from the final rejection of claims 18-26 and 28-31 was filed on November 20, 2006. Appellants hereby file one copy of this Appeal Brief, together with the required fee set forth in 37 C.F.R. § 41.20(b)(2).

It is not believed that extensions of time are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-0036.

01/23/2007 SZEWDIE1 00000048 10607193

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I. Real Party In Interest (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest in this appeal is ASML Holding N.V., having its principal place of business at De Run 6501, NL - 5504 DR, Veldhoven, The Netherlands. An assignment assigning all right, title and interest in and to the above-captioned patent application from the inventors Lev Ryzhikov and Stanislav Smirnov to ASML Holding N.V. was recorded in the U.S. Patent & Trademark Office (USPTO) on June 27, 2005 at Reel 014254, Frame 0490.

II. Related Appeals and Interferences (37 C.F.R. § 41.37(c)(1)(ii))

Appellants, including the undersigned legal representative and the assignee of the above-captioned application, are aware of no pending appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board of Patent Appeals and Interferences (“the Board”) in the pending appeal.

III. Status of Claims (37 C.F.R. § 41.37(c)(1)(iii))

The Application was filed on June 27, 2003, and was assigned U.S. Application No. 10/607,193 (“the ‘193 application”). The ‘193 application originally included claims 1-17. The Examiner mailed an Office Action rejecting claims 1-17 on November 3, 2004. In an Amendment and Reply filed February 1, 2005, Appellants added claims 18-28 and cancelled claims 1-17. A final Office Action finally rejecting claims 18-28 was mailed April 19, 2005. In an after final Reply filed June 9, 2005, Appellants argued the patentability of claims 18-28. An Advisory Action was mailed June 21, 2005, stating the after final Reply was not persuasive.

Appellants filed a Request for Continuing Examination (“RCE”) on July 15, 2005. In the RCE, Appellants submitted a Preliminary Amendment in which claims 29-30 were sought to be added, claim 27 was sought to be cancelled, and claims 18 and 28 were sought to be amended. An Office Action rejecting claims 18-26 and 29-30 was mailed September 6, 2005. In an Amendment and Reply filed December 5, 2005, Appellants added claim 31 and claim 18 was amended. A final Office Action was

mailed December 29, 2005. In the final Office Action, the Examiner finally rejection claims 18-26 and 28-31.

Appellants filed a second RCE on March 28, 2006. In the second RCE, Appellants submitted a Preliminary Amendment in which claims 18 and 31 were amended. An Office Action rejecting claims 18-26 and 29-31 was mailed April 14, 2006. In an Amendment and Reply filed July 13, 2006, Appellants amended claim 31. A final Office Action was mailed August 22, 2006. In the final Office Action, the Examiner finally rejection claims 18-26 and 28-31.

In Arguments to Accompany the Pre-Appeal Brief Request for Review, Appellants presented arguments why the final Office Action of August 22, 2006 was improper. In a Pre Appeal Conference Decision mailed December 22, 2006, the rejection of claims 18-26 and 28-31 was continued and the application was passed to the Board of Patent Appeals and Interferences.

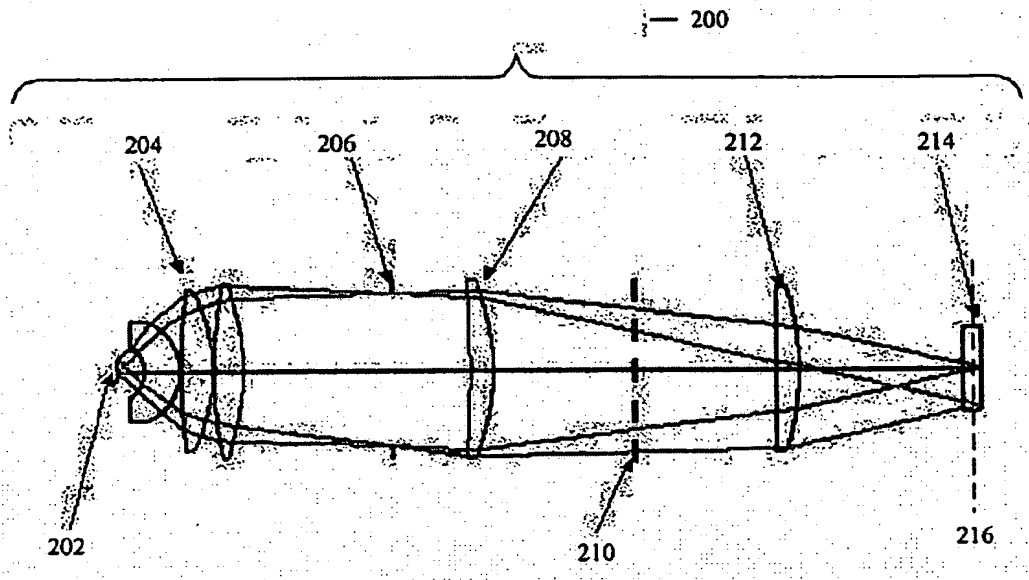
Claims 18-26 and 28-31 are on appeal. A copy of the claims on appeal can be found in the attached Claims Appendix.

IV. Status of Amendments (37 C.F.R. § 41.37(c)(1)(iv))

All amendments have been entered, and claims 18-26 and 28-31 are pending. No amendments were made after the final Office Action of August 22, 2006.

V. Summary of Claimed Subject Matter (37 C.F.R. § 41.37(c)(1)(v))

A. Exemplary Teaching of Claimed Invention



In one exemplary embodiment of the claimed invention, FIG. 2 shows a relay lens 200 in illuminating optics 110. (See paragraph 0016). Relay lens 200 includes a delimiter plane 202, a first lens group 204 (e.g., a front portion), an aperture stop 206 (e.g., a variable aperture stop), a second lens group 208 (e.g., an intermediate portion), a fold mirror 210, a third lens group 212 (e.g., a field portion), and a reticle 214 having a reticle plane 216. (*Id.*). First lens group 204 can include a meniscus lens and a lens with an aspherical surface. (*Id.*). In the embodiments shown in FIG. 2, second and third lens groups 208 and 212 each have only a single lens element. (*Id.*). Second lens group 208 can have a single lens with one aspherical surface, which can be a convex surface. (*Id.*). Third lens group 212 can have a single lens that has a spherical surface. (*Id.*).

B. Exemplary Teaching for Claim 18

Claim 18 recites a relay lens system positioned between a delimiter plane and a pattern generator plane of a lithography system, comprising:

a first lens group comprising three lenses that decrease numerical aperture of a received beam of radiation;

a second lens group having at least one lens that receives the beam of radiation from the first lens group and controls characteristics of the beam of radiation at a pupil plane;

a third lens group consisting of a single lens element made from a single material having a single index of refraction that receives the beam of radiation from the second lens group and controls field characteristics of the beam of radiation at a patterning device plane;

an aperture stop positioned between the first and second lens groups; and

a fold mirror positioned between the second and third lens groups.

In view of **a first lens group** in claim 18, in one example a first lens group is shown as element 204 in Figure 2.

In view of **a second lens group** in claim 18, in one example a second lens group is shown as element 208 in Figure 2.

In view of **a third lens group** in claim 18, in one example a third lens group is shown as element 212 in Figure 2.

In view of **an aperture stop** in claim 18, in one example an aperture stop is shown as element 206 in Figure 2.

In view of **a fold mirror** in claim 18, in one example a fold mirror is shown as element 210 in Figure 2.

C. Exemplary Teaching for Claim 31

Claim 31 recites a relay lens system in an illumination system of a lithography system, comprising:

a first lens group comprising three lenses;

a second lens group comprising two or three lenses;

a third lens group consisting of a single lens made from one material having one index of refraction and

having a spherical receiving surface and an aspherical transmitting surface;
an aperture stop positioned between the first and second lens groups; and
a fold mirror positioned between the second and third lens groups..

In view of **a first lens group** in claim 31, in one example a first lens group is shown as element 204 in Figure 2.

In view of **a second lens group** in claim 31, in one example a second lens group is shown as element 208 in Figure 2.

In view of **a third lens group** in claim 31, in one example a third lens group is shown as element 212 in Figure 2.

In view of **an aperture stop** in claim 31, in one example an aperture stop is shown as element 206 in Figure 2.

In view of **a fold mirror** in claim 31, in one example a fold mirror is shown as element 210 in Figure 2.

VI. Grounds of Rejection to be Reviewed on Appeal (37 C.F.R. § 41.37(c)(1)(vi))

A concise statement listing each ground of rejection presented for review follows.

A. Ground 1

Claims 18, 19, 21-26, and 28-31 were finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over WO 98/28644 to Schultz ("Schultz") (using U.S. Patent No. 6,366,410 as a translation).

B. Ground 2

Claim 20 was finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Schultz in view of U.S. Published Patent Application No. 2002/0036832 to Schultz ("Schultz II").

VII. Argument (37 C.F.R. § 41.37(c)(1)(vii))

A. Rejection of claims 18 and 31 under 35 U.S.C. § 103(a)

Claims 18, 19, 21-26, and 28-31 were finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Schultz. Claim 20 was finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Schultz in view of Schultz II.

1. The Obviousness Rejection with Respect to Claims 18 and 31 is in Error and Must be Reversed

a) Distinguishing Features in Claims 18 and 31

Claim 18 recites features that distinguish over the applied references. For example, claim 18 recites (emphasis added):

... a third lens group **consisting of a single lens element** made from a single material having a single index of refraction that receives the beam of radiation from the second lens group and controls field characteristics of the beam of radiation at a patterning device plane

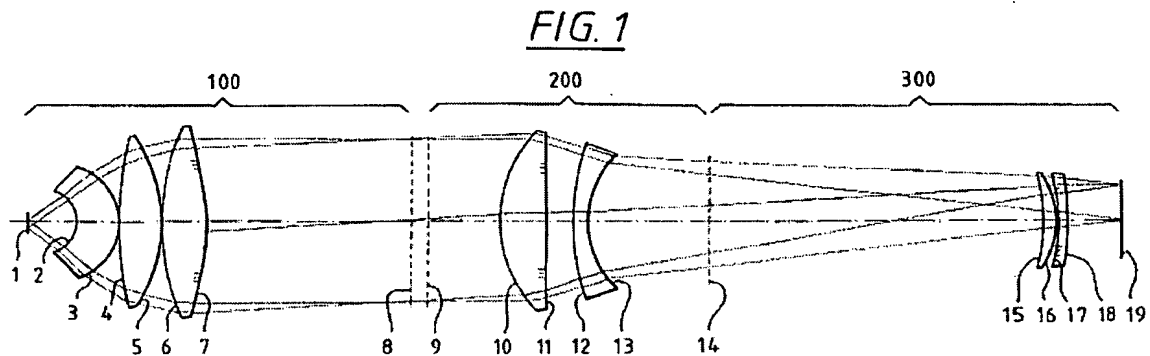
Claim 31 recites features that distinguish over the applied references. For example, claim 31 recites (emphasis added):

... a third lens group **consisting of a single lens** made from one material having one index of refraction and having a spherical receiving surface and an aspherical transmitting surface.... .

None of the applied references, either alone or in an alleged obvious combination, teach or suggest these distinguishing features. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness for claims 18 and 31. Also, each of claims 19-26 and 28-30 recites additional distinguishing features that are not taught or suggested in the applied references. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness for the claims depending from claim 18.

b) Summary of Most Relevant Teachings in Schultz

Figure 1 of Schultz (reproduced below) teaches of a condenser portion 100, constructed as a partial objective, in front of the aperture diaphragm 8, an intermediate portion 200, and a field lens portion 300. (Schultz, column 2, line 64 to column 3, line 9). Air spaces are at an object plane 1, at a diaphragm plane 8, between the intermediate portion 200 and the field lens portion 300, and also at a reticle plane 19. (Schultz, column 3, lines 20-30).



Schultz teaches at length of the inventors' non-trivial reduction of its field lens group 300 to a minimum of two lenses. (Schultz, column 3, lines 63-66). Each of the two lenses is required to perform a particular respective operation in the processing of light (e.g., collection and diverging of light). (Schultz, column 3, line 66 to column 4, line 6). This is because Schultz is directed to a reticle masking (REMA) device found in an illumination system of a lithography system that processes light, such that the light has the proper optical characteristics to most optimally illuminate a reticle.

c) The Examiner Failed To Properly Construe The Claimed Features

Claims 18 and 31 both use the transitional phrase "consisting of," which is a very limiting transitional phrase. *See, e.g.,* M.P.E.P. Section 2111.03; *Vehicular Technologies Corp. v. Titan Wheel Int'l, Inc.*, 212 F.3d 1377, 53 U.S.P.Q.2d 1841 (Fed. Cir. 2000) (stating "consisting of" means I claim what follows and nothing else, allowing for restriction and exclusion for that element); *AFG Industries, Inc. v. Cardinal IG Company, Inc.*, 239 F.3d 1239, 57 U.S.P.Q.2d 1776 (Fed. Cir. 2001) (stating that "consisting of" excludes any elements, steps, or ingredients not specified in the claim).

Through use of this transitional phrase, the Examiner must find a reference that identically teaches or suggests a feature associated with the term. In claims 18 and 31, the claimed feature including this transitional phrase is that a third lens group consists of **a single lens**. However, the Examiner has failed to apply any reference that teaches or suggests this exact feature. This is because Schultz specifically teaches, at col. 3, line 63 to col. 4, line 2, that the inventors developed a third lens group with field lens characteristics **with a minimum of two lenses**.

Schultz II is not used to teach or suggest this distinguishing feature of claims 18 and 31, nor does it teach or suggest this feature. Thus, Schultz II does nothing to cure the deficiencies of Schultz.

Therefore, the applied references cannot be used to establish a *prima facie* case of obviousness for these claims.

d) There is No Motivation to Apply Schultz Absent Impermissible Hindsight

There is no motivation to apply Schultz, at least in the new way the Examiner has now applied Schultz in the final Office Action, absent impermissible hindsight. This can be partially shown through the Examiner's repeated use of Schultz in previous rejections without using this new argument (which also destroys the teaching of Schultz, as discussed below). Apparently guided by Appellants' previous arguments, the Examiner withdrew all previous rejections and applied Schultz in this new and impermissible way.

For example, on page 3 of the final Office Action, the Examiner relies on unsubstantiated conclusions to meet the claimed invention of claims 18 and 31 when the Examiner states:

It is within the skill of one of ordinary skill in the art to classify the two lenses as separate lens groups absent any specific definition of a lens group. It would have been obvious ... to reclassify the lens groups of Schulz (sic) for the purpose of succinctly identifying the optical elements associated with the third lens group to more accurately convey the specific optical element in question when addressing the third lens group.

It appears to the Appellants that the Examiner developed this argument after reading Appellants' previous arguments and Appellants' instant specification, i.e.,

through hindsight. Thus, there is no motivation to apply Schultz as done in the final Office Action absent the use of impermissible hindsight by the Examiner. *Interconnect Planning Corp. v Feil*, 777 F.2d 1132, 227 U.S.P.Q. 543 (Fed. Cir. 1985) (stating that when prior art references require selective combination to render obvious a subsequent invention, it is an error to reconstruct the patentee's claimed invention using the patentee's claims as a blueprint, there must be other motivation.); *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991) (stating it was impermissible to use applicant's structure as a template to select elements from a reference or references to fill in the gaps); *Para-Ordnance Manufacturing, Inc. v. SGS Importers International, Inc.*, 73 F.3d 1085, 1087, 37 U.S.P.Q.2d 1237, 1239 (Fed. Cir. 1995) ("Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor.").

Schultz II does nothing to cure the deficiencies of Schultz.

Therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

e) The Examiner Has Destroyed The Teaching In Schultz Because Schultz Teaches Away From The Claimed Invention

The Examiner's application of Schultz to the claimed invention has destroyed the teaching of Schultz because Schultz teaches away from the claimed invention. *See, e.g.*, M.P.E.P. Sections 2141.02 and 2145(X)(D)(2).

For example, Schultz specifically teaches:

The design of the **field lens group 300** is **decisive** for matching. In the example, it is reduced to **the minimum of two lenses**, the collecting lens 15, 16 and the divergent lens 17, 18. The aspheric element then required--as otherwise many spherical elements would be required--is the surface 17. The main beam heights are greater than the marginal ray heights in this region.

Schultz, col. 3, line 63 to col. 4, line 2 (emphasis added). It appears important that the patentee chose to use the word "decisive" for this feature. It appears Schultz was stating the design **had** to be done this way, and this was the patentable feature.

However, the claims recite, for example (emphasis added),

18. ...a third lens group consisting of a single lens element made from a single material having a single index of refraction that receives the beam of radiation from the second lens group and controls field characteristics of the beam of radiation at a patterning device plane....

31. ...a third lens group consisting of a single lens made from one material having one index of refraction and having a spherical receiving surface and an aspherical transmitting surface....

Thus, as discussed above, Schultz teaches at length of the inventors' non-trivial reduction of its field lens group 300 to a minimum of two lenses. Each of the two lenses is required to perform a particular respective operation in the processing of light (e.g., collection and diverging of light). This is because Schultz is directed to a REMA found in an illumination system of a lithography system that processes light, such that the light has the proper optical characteristics to most optimally illuminate a reticle. However, claims 18 and 31 respectively recite, again emphasizing the use of the very restrictive transitional phrase "consisting of," "a third lens group consisting of a single lens/single lens element." This third lens group is also recited as being a "field" lens group, for example in paragraph 0016 of the instant specification, which states "a third lens group 212 (e.g., a field portion)."

Thus, under the prevailing patent law, the Examiner has improperly ignored this teaching in Schultz. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986) (stating a reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention much be considered); *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 16 U.S.P.Q.2d 1933 (Fed. Cir. 1990) (stating the closest prior art should not be used because the closest prior art "would likely discourage the art worker from attempting the substitution suggested by the [inventor/patentee]."); *In re Gurley*, 27 F.3d 551, 31 U.S.P.Q.3d 1130 (Fed. Cir. 1994) ("A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ...would be led in a direction divergent from the path that was taken by the applicant.")

Also, Appellants do not believe a person having ordinary skill in the art at the time of the invention would have found it obvious to remove one optical element from

the third system in Schultz, or as the Examiner now suggests, to rename the elements in the third system in Schultz, as there is no motivation to make this change found in Schultz. Nothing in Schultz teaches or suggests a skilled artisan could or should make this modification, as Schultz actually teaches away from wanting to do this.

Schultz II does nothing to cure the deficiencies of Schultz.

Therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

f) Omission of an Element with Retention of the Element's Function Is an Indicia of Unobviousness

It is well known under the law that the omission of an element with retention of the element's function is an indicia of unobviousness. *See, e.g.*, M.P.E.P. 2144 04(II)(B) and *In re Edge*, 359 F.2d 896, 149 U.S.P.Q. 556 (C.C.P.A. 1966). In *In re Edge*, as discussed in the M.P.E.P., the claims at issue were directed to a printed sheet having a thin layer of erasable metal bonded directly to the sheet wherein said thin layer obscured the original print until removal by erasure. The prior art disclosed a printed sheet that further comprised an intermediate transparent and erasure-proof protecting layer, which prevented erasure of the printing when the top layer was erased. The claims were found unobvious over the prior art because, although the transparent layer of the prior art was eliminated, the function of the transparent layer was retained since appellant's metal layer could be erased without erasing the printed indicia.

Similar to the above case, Schultz teaches of requiring an additional element, first and second lenses, in the third lens group or field lens group 300. Also, similarly to the above case law, in the present prosecution Appellants have removed an element from the third lens group, e.g., a field portion or field lens group 212 in Figure 2, while retaining the function of the third lens group, e.g., to control a field portion of the relay lens system. Therefore, the omission of an element in the pending claims, i.e., one lens from the third lens group or field portion of the relay system, with retention of the element's (e.g., the field portions) function is an indicia of unobviousness of the claimed invention in view of Schultz's requirement of having two lenses in the field lens group.

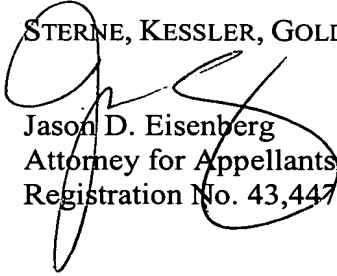
Accordingly, for this additional reason, the Examiner has failed to establish a *prima facie* case of obviousness.

VIII. Conclusion

The subject matter of claims 18-26 and 28-31 is patentable over the applied references because the Examiner has failed to establish a *prima facie* case of obviousness. Therefore, Appellants respectfully requests that the Board reverse the Examiner's final rejection of these claims under 35 U.S.C. § 103(a) and remand this application for issue.

Respectfully submitted,

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IX. Claims Appendix

18. A relay lens system positioned between a delimiter plane and a pattern generator plane of a lithography system, comprising:

a first lens group comprising three lenses that decrease numerical aperture of a received beam of radiation;

a second lens group having at least one lens that receives the beam of radiation from the first lens group and controls characteristics of the beam of radiation at a pupil plane;

a third lens group consisting of a single lens element made from a single material having a single index of refraction that receives the beam of radiation from the second lens group and controls field characteristics of the beam of radiation at a patterning device plane;

an aperture stop positioned between the first and second lens groups; and

a fold mirror positioned between the second and third lens groups.

19. The system of claim 18, wherein the second lens group consists of two lenses.

20. The system of claim 18, wherein the second lens group consists of three lenses.

21. The system of claim 18, wherein one of the three lenses in the first lens group is a meniscus lens.

22. The system of claim 18, wherein two of the three lenses in the first lens group are biconvex lenses.

23. The system of claim 22, wherein one of the two biconvex lenses has an aspherical surface.

24. The system of claim 18, wherein the at least one lens in the second lens group has at least one aspherical surface.

25. The system of claim 18, wherein the at least one lens in the second lens group has at least one convex surface.

26. The system of claim 18, wherein the single lens in the third lens group comprises two spherical surfaces.

28. The system of claim 18, further comprising:
a light source positioned before the first lens group; and
a pattern generator positioned after the third lens group in the pattern generator plane.

29. The system of claim 18, wherein the characteristics controlled by the second lens group comprise at least one of pupil aberration correction, pupil shape correction, ellipticity correction, and telecentricity correction.

30. The system of claim 18, wherein the field characteristics controlled by the third lens group comprises at least one of creating a desired field size at the pattern generator plane and correcting telecentricity.

31. A relay lens system in an illumination system of a lithography system, comprising:
a first lens group comprising three lenses;
a second lens group comprising two or three lenses;
a third lens group consisting of a single lens made from one material having one index of refraction and having a spherical receiving surface and an aspherical transmitting surface;
an aperture stop positioned between the first and second lens groups; and
a fold mirror positioned between the second and third lens groups.

X. Evidence Appendix

None.

XI. Related Proceedings Appendix

None.